*SEM 2017: The Sixth Joint Conference on
Lexical and Computational Semantics

Proceedings of the Conference

August 3-4, 2017
Vancouver, Canada
*SEM 2017 is sponsored by:

The Association for Computational Linguistics

©2017 The Association for Computational Linguistics

Order copies of this and other ACL proceedings from:

Association for Computational Linguistics (ACL)
209 N. Eighth Street
Stroudsburg, PA 18360
USA
Tel: +1-570-476-8006
Fax: +1-570-476-0860
acl@aclweb.org

Preface by the General Chair

The 2017 edition of *SEM, the 6th in the annual series, took on as its theme “representations of meaning”, an area of acute interest in the field for the past several years. The conference program shows that this year’s *SEM has been especially successful in covering its theme from a broad range of perspectives, including various flavors of distributional, lexical, and formal/linguistic semantics. Thus, the 2017 conference meets the overall goal of the *SEM series, by bridging across relatively independent communities approaching the computational modeling of semantics from different angles. Hopefully, the diversity of the program will provide not only something of interest to a broad audience of NLP researchers, but also serve to stimulate new ideas and synergies that can significantly impact the field.

As always, *SEM would not have been possible without the active involvement of our community. Aside from our dedicated program committee, to whom we give an extended acknowledgement further in this introduction, we are very thankful to Eduardo Blanco (Publicity Chair) and Sandro Pezzelle (Publication Chair) for their efficiency and hard work in making the conference a visible event, from website to proceedings. We are particularly grateful to ACL SIGLEX, who made it possible to offer two exciting keynotes, and to SIGLEX and Lexical Computing for supporting the annual Adam Kilgarriff Award for the best paper at *SEM 2017. Our keynote speakers, Yejin Choi and Katrin Erk, are owed special thanks for taking part in the selection of the best paper.

On behalf of the Program Committee Chairs, to whom we owe the greatest debt for the excellence of the program, and myself as General Chair, I invite you to explore, exploit, and enjoy the diversity of perspectives on the computational modeling of semantics that *SEM 2017 strives to provide.

Nancy Ide,
General Chair of *SEM 2017
Preface by the Program Chairs

We are pleased to present this volume containing the papers accepted at the Sixth Joint Conference on Lexical and Computational Semantics (*SEM 2017, co-located with ACL in Vancouver, Canada, on August 3-4, 2017).

*SEM received a record number of submissions this year, which allowed us to compile a diverse and high-quality program. The number of submissions was over one hundred (107). After we had discarded some papers due to formal issues, 101 papers were reviewed for the conference, (52 long and 49 short). Out of these, 36 papers were accepted (22 long, 14 short). Thus, the acceptance rate was 35.6% overall, 42.3% for the long papers and 28.6% for the short submissions. Some of the papers were withdrawn after acceptance, due to multiple submissions to other conferences (the 2017 schedule was particularly complicated, with significant intersection of *SEM with EMNLP, CoNLL, IWCS and other venues). The final number of papers in the program is 30.

Submissions were reviewed in 9 different areas: Representations of Meaning (special topic of interest), Distributional Semantics, Semantics for Applications, Lexical Semantics, Lexical Resources and Ontologies, Discourse and Dialogue, Semantic Parsing and Semantic Role Labeling, Multimodal Semantics, Formal and Linguistic Semantics. The most prolific areas were Distributional Semantics (19 submitted papers), Representations of Meaning (15), and Semantics for Applications (15).

The papers were evaluated by a program committee of 14 area chairs from Asia, Europe and North America, assisted by a panel of 167 reviewers. Each submission was reviewed by three reviewers, who were furthermore encouraged to discuss any divergence in evaluation. The papers in each area were subsequently ranked by the area chairs. The final selection was made by the program co-chairs after an independent check of all reviews and discussion with the area chairs. Reviewers’ recommendations were also used to shortlist a set of papers nominated for the Adam Kilgarriff Award. These papers were judged by a committee chaired by Nancy Ide.

The final *SEM 2017 program consists of 17 oral presentations and 13 posters, as well as two keynote talks by Yejin Choi (“From Naive Physics to Connotation: Modeling Commonsense in Frame Semantics”, joint keynote with SemEval 2017) and Katrin Erk (“What do you know about an alligator when you know the company it keeps?”).

We are deeply thankful to all area chairs and reviewers for their help in the selection of the program, for their readiness in engaging in thoughtful discussions about individual papers, and for providing valuable feedback to the authors. We are also grateful to Eduardo Blanco for his precious help in publicizing the conference, and to Sandro Pezzelle for his dedication and thoroughness in turning the program into the proceedings you now have under your eyes. Last but not least, we are indebted to our General Chair, Nancy Ide, for her continuous guidance and support throughout the process of organizing this installment of *SEM.

We hope you enjoy the conference!

Aurélie Herbelot & Lluís Màrquez,
Program Co-Chairs of *SEM 2017
SEM 2017 Chairs and Reviewers

General Chair:
Nancy Ide, Vassar College, USA

Program Co-Chairs:
Aurélie Herbelot, University of Trento, Italy
Lluís Màrquez, Qatar Computing Research Institute, Qatar

Publication Chair:
Sandro Pezzelle, University of Trento, Italy

Publicity Chair:
Eduardo Blanco, University of North Texas, USA

Area Chairs:
Representations of meaning
Tim Baldwin, University of Melbourne, Australia
Louise McNally, Universitat Pompeu Fabra, Spain

Semantics for applications
Roser Morante, Vrije Universiteit Amsterdam, the Netherlands
Mark Sammons, University of Illinois at Urbana-Champaign, USA

Lexical semantics, figurative language
Diana Inkpen, University of Ottawa, Canada
Ekaterina Shutova, University of Cambridge, UK

Distributional semantics
Alessandro Lenci, University of Pisa, Italy
Islam Beltagy, University of Texas at Austin, USA

Coreference, discourse and dialogue
Raquel Fernández, University of Amsterdam, the Netherlands
Nianwen Xue, Brandeis University, USA

Lexical resources, linked data, ontologies
Simone Paolo Ponzetto, University of Mannheim, Germany

Formal and linguistic semantics
Laura Rimell, University of Cambridge, UK

Semantic parsing and semantic role labeling
Luke Zettlemoyer, University of Washington, USA

Semantics in multimodal approaches
Angeliki Lazaridou, DeepMind
Reviewers:
Invited Talk: From Naive Physics to Connotation: Modeling Commonsense in Frame Semantics

Yejin Choi
(Joint Invited Speaker with SemEval 2017)

University of Washington, USA

Abstract

Intelligent communication requires reading between the lines, which in turn, requires rich background knowledge about how the world works. However, learning unspoken commonsense knowledge from language is nontrivial, as people rarely state the obvious, e.g., “my house is bigger than me.” In this talk, I will discuss how we can recover the trivial everyday knowledge just from language without an embodied agent. A key insight is this: The implicit knowledge people share and assume systematically influences the way people use language, which provides indirect clues to reason about the world. For example, if “Jen entered her house”, it must be that her house is bigger than her. I will discuss how we can model a variety of aspects of knowledge – ranging from naive physics to connotation – adapting the representations of frame semantics.
How can people learn about the meaning of a word from textual context? If we assume that lexical knowledge has to do with truth conditions, then what can textual (distributional) information contribute? I will argue that at the least, an agent can observe how textual contexts co-occur with concepts that have particular properties, and that the agent can use this information to make inferences about unknown words: “I don’t know what an alligator is, but it must be something like a crocodile”. I will further argue that this inference can only be noisy and partial, and is best described in probabilistic terms.
# Table of Contents

**What Analogies Reveal about Word Vectors and their Compositionality**  
Gregory Finley, Stephanie Farmer and Serguei Pakhomov ......................................................... 1

**Learning Antonyms with Paraphrases and a Morphology-Aware Neural Network**  
Sneha Rajana, Chris Callison-Burch, Marianna Apidianaki and Vered Shwartz ......................... 12

**Decoding Sentiment from Distributed Representations of Sentences**  
Edoardo Maria Ponti, Ivan Vulić and Anna Korhonen ................................................................. 22

**Detecting Asymmetric Semantic Relations in Context: A Case-Study on Hypernymy Detection**  
Yogarshi Vyas and Marine Carpuat .............................................................................................. 33

**Domain-Specific New Words Detection in Chinese**  
Ao Chen and Maosong Sun ........................................................................................................... 44

**Deep Learning Models For Multiword Expression Identification**  
Waseem Gharbieh, Virendrakumar Bhavsar and Paul Cook ...................................................... 54

**Emotion Intensities in Tweets**  
Saif Mohammad and Felipe Bravo-Marquez ................................................................................. 65

**Deep Active Learning for Dialogue Generation**  
Nabiha Asghar, Pascal Poupart, Xin Jiang and Hang Li ............................................................... 78

**Mapping the Paraphrase Database to WordNet**  
Anne Cocos, Marianna Apidianaki and Chris Callison-Burch .................................................... 84

**Semantic Frame Labeling with Target-based Neural Model**  
Yukun Feng, Dong Yu, Jian Xu and Chunhua Liu ........................................................................ 91

**Frame-Based Continuous Lexical Semantics through Exponential Family Tensor Factorization and Semantic Proto-Roles**  
Francis Ferraro, Adam Poliak, Ryan Cotterell and Benjamin Van Durme ............................... 97

**Distributed Prediction of Relations for Entities: The Easy, The Difficult, and The Impossible**  
Abhijeet Gupta, Gemma Boleda and Sebastian Padó ................................................................. 104

**Comparing Approaches for Automatic Question Identification**  
Angel Maredia, Kara Schechtman, Sarah Ita Levitan and Julia Hirschberg .......................... 110

**Does Free Word Order Hurt? Assessing the Practical Lexical Function Model for Croatian**  
Zoran Medić, Jan Šnajder and Sebastian Padó ........................................................................... 115

**A Mixture Model for Learning Multi-Sense Word Embeddings**  
Dai Quoc Nguyen, Dat Quoc Nguyen, Ashutosh Modi, Stefan Thater and Manfred Pinkal ... 121

**Aligning Script Events with Narrative Texts**  
Simon Ostermann, Michael Roth, Stefan Thater and Manfred Pinkal ....................................... 128

**The (too Many) Problems of Analogical Reasoning with Word Vectors**  
Anna Rogers, Aleksandr Drozd and Bofang Li .............................................................................. 135
Semantic Frames and Visual Scenes: Learning Semantic Role Inventories from Image and Video Descriptions
Ekaterina Shutova, Andreas Wundsam and Helen Yannakoudakis ........................................ 149

Acquiring Predicate Paraphrases from News Tweets
Vered Shwartz, Gabriel Stanovsky and Ido Dagan ................................................................. 155

Evaluating Semantic Parsing against a Simple Web-based Question Answering Model
Alon Talmor, Mor Geva and Jonathan Berant ................................................................. 161

Logical Metonymy in a Distributional Model of Sentence Comprehension
Emmanuele Chersoni, Alessandro Lenci and Philippe Blache ........................................ 168

Double Trouble: The Problem of Construal in Semantic Annotation of Adpositions
Jena D. Hwang, Archna Bhatia, Na-Rae Han, Tim O’Gorman, Vivek Srikumar and Nathan Schneider ................................................................. 178

Issues of Mass and Count: Dealing with ‘Dual-Life’ Nouns
Tibor Kiss, Francis Jeffry Pelletier, Halima Husic and Johanna Poppek ................................ 189

Parsing Graphs with Regular Graph Grammars
Sorcha Gilroy, Adam Lopez and Sebastian Maneth ................................................................. 199

Embedded Semantic Lexicon Induction with Joint Global and Local Optimization
Sujay Kumar Jauhar and Eduard Hovy ................................................................. 209

Generating Pattern-Based Entailment Graphs for Relation Extraction
Kathrin Eichler, Feiyu Xu, Hans Uszkoreit and Sebastian Krause ........................................ 220

Classifying Semantic Clause Types: Modeling Context and Genre Characteristics with Recurrent Neural Networks and Attention
Maria Becker, Michael Staniek, Vivi Nastase, Alexis Palmer and Anette Frank .................. 230

Predictive Linguistic Features of Schizophrenia
Efsun Sarioglu Kayi, Mona Diab, Luca Pauselli, Michael Compton and Glen Coppersmith . . . 241

Learning to Solve Geometry Problems from Natural Language Demonstrations in Textbooks
Mrinmaya Sachan and Eric Xing ................................................................. 251

Ways of Asking and Replying in Duplicate Question Detection
João António Rodrigues, Chakaveh Saedi, Vladislav Maraev, João Silva and António Branco . 262
Conference Program

August 3rd, 2017

9:00–10:30 Session S1: Invited Talk (Jointly with SemEval) and Best Paper Award

9:00–9:15 Opening Remarks

Yejin Choi

10:15–10:30 Announcement of the Adam Kilgarriff Best Paper Award

10:30–11:00 Coffee Break

11:00–12:30 Session S2: Distributional Semantics

11:00–11:30 What Analogies Reveal about Word Vectors and their Compositionality
Gregory Finley, Stephanie Farmer and Serguei Pakhomov

11:30–12:00 Learning Antonyms with Paraphrases and a Morphology-Aware Neural Network
Sneha Rajana, Chris Callison-Burch, Marianna Apidianaki and Vered Shwartz

12:00–12:30 Decoding Sentiment from Distributed Representations of Sentences
Edoardo Maria Ponti, Ivan Vulić and Anna Korhonen

12:30–14:00 Lunch Break
August 3rd, 2017 (continued)

14:00–15:30  Session S3: Lexical Semantics and Lexical Resources

14:00–14:30  Detecting Asymmetric Semantic Relations in Context: A Case-Study on Hypernymy Detection
Yogarshi Vyas and Marine Carpuat

14:30–15:00  Domain-Specific New Words Detection in Chinese
Ao Chen and Maosong Sun

15:00–15:30  Deep Learning Models For Multiword Expression Identification
Waseem Gharbieh, Virendrakumar Bhavsar and Paul Cook

15:30–16:00  Coffee Break

16:00–16:30  Session S4: Lexical Semantics and Lexical Resources (continued)

16:00–16:30  Emotion Intensities in Tweets
Saif Mohammad and Felipe Bravo-Marquez

16:30–18:00  Session S5: Poster Session

Deep Active Learning for Dialogue Generation
Nabiha Asghar, Pascal Poupart, Xin Jiang and Hang Li

Mapping the Paraphrase Database to WordNet
Anne Cocos, Marianna Apidianaki and Chris Callison-Burch

Semantic Frame Labeling with Target-based Neural Model
Yukun Feng, Dong Yu, Jian Xu and Chunhua Liu

Frame-Based Continuous Lexical Semantics through Exponential Family Tensor Factorization and Semantic Proto-Roles
Francis Ferraro, Adam Poliak, Ryan Cotterell and Benjamin Van Durme
Distributed Prediction of Relations for Entities: The Easy, The Difficult, and The Impossible
Abhijeet Gupta, Gemma Boleda and Sebastian Padó

Comparing Approaches for Automatic Question Identification
Angel Maredia, Kara Schechtman, Sarah Ita Levitan and Julia Hirschberg

Does Free Word Order Hurt? Assessing the Practical Lexical Function Model for Croatian
Zoran Medić, Jan Šnajder and Sebastian Padó

A Mixture Model for Learning Multi-Sense Word Embeddings
Dai Quoc Nguyen, Dat Quoc Nguyen, Ashutosh Modi, Stefan Thater and Manfred Pinkal

Aligning Script Events with Narrative Texts
Simon Ostermann, Michael Roth, Stefan Thater and Manfred Pinkal

The (too Many) Problems of Analogical Reasoning with Word Vectors
Anna Rogers, Aleksandr Drozd and Bofang Li

Semantic Frames and Visual Scenes: Learning Semantic Role Inventories from Image and Video Descriptions
Ekaterina Shutova, Andreas Wundsam and Helen Yannakoudakis

Acquiring Predicate Paraphrases from News Tweets
Vered Shwartz, Gabriel Stanovsky and Ido Dagan

Evaluating Semantic Parsing against a Simple Web-based Question Answering Model
Alon Talmor, Mor Geva and Jonathan Berant
August 4th, 2017

9:00–10:30 Session S6: Invited Talk and Distributional Semantics

9:00–10:00 Invited Talk: What Do You Know About an Alligator When You Know the Company It Keeps?
Katrin Erk

10:00–10:30 Logical Metonymy in a Distributional Model of Sentence Comprehension
Emmanuele Chersoni, Alessandro Lenci and Philippe Blache

10:30–11:00 Coffee Break

11:00–12:30 Session S7: Linguistic and Formal Semantics

11:00–11:30 Double Trouble: The Problem of Construal in Semantic Annotation of Adpositions
Jena D. Hwang, Archna Bhatia, Na-Rae Han, Tim O’Gorman, Vivek Srikumar and Nathan Schneider

11:30–12:00 Issues of Mass and Count: Dealing with ‘Dual-Life’ Nouns
Tibor Kiss, Francis Jeffry Pelletier, Halima Husic and Johanna Poppek

12:00–12:30 Parsing Graphs with Regular Graph Grammars
Sorcha Gilroy, Adam Lopez and Sebastian Maneth

12:30–14:00 Lunch Break
August 4th, 2017 (continued)

14:00–15:30 Session S8: Representations of Meaning

14:00–14:30  
*Embedded Semantic Lexicon Induction with Joint Global and Local Optimization*
Sujay Kumar Jauhar and Eduard Hovy

14:30–15:00  
*Generating Pattern-Based Entailment Graphs for Relation Extraction*
Kathrin Eichler, Feiyu Xu, Hans Uszkoreit and Sebastian Krause

15:00–15:30  
*Classifying Semantic Clause Types: Modeling Context and Genre Characteristics with Recurrent Neural Networks and Attention*
Maria Becker, Michael Staniek, Vivi Nastase, Alexis Palmer and Anette Frank

15:30–16:00  
*Coffee Break*

16:00–17:30 Session S9: Semantics for Applications

16:00–16:30  
*Predictive Linguistic Features of Schizophrenia*
Efsun Sarioglu Kayi, Mona Diab, Luca Pauselli, Michael Compton and Glen COPPERSMITH

16:30–17:00  
*Learning to Solve Geometry Problems from Natural Language Demonstrations in Textbooks*
Mrinmaya Sachan and Eric Xing

17:00–17:30  
*Ways of Asking and Replying in Duplicate Question Detection*
João António Rodrigues, Chakaveh Saedi, Vladislav Maraev, João Silva and António Branco

17:30–17:40  
*Closing Remarks*